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WHAT IS CLAIMED IS:

1. A composition comprising an amyloid β (Aβ) polypeptide and a non-Aβ polypeptide, wherein said Aβ polypeptide and said non-Aβ polypeptide are linked.

2. The composition of claim 1, wherein said composition further comprises a pharmaceutically acceptable carrier or excipient.

3. The composition of claim 1, wherein said non-Aβ polypeptide is an antibody.

4. The composition of claim 3, wherein said antibody comprises a Fab fragment.

5. The composition of claim 3, wherein said antibody comprises a single chain Fv antibody fragment.

6. The composition of claim 3, wherein said antibody comprises a $F(ab)_2$ fragment.

7. The composition of claim 3, wherein said antibody has specific binding affinity for amyloid.

8. The composition of claim 3, wherein said antibody is labeled with a radioisotope or a contrast agent.

9. The composition of claim 3, wherein said antibody is labeled with a contrast agent.

10. The composition of claim 1, wherein said non-Aβ polypeptide is an enzyme or a cytokine.

11. The composition of claim 10, wherein said enzyme is an antioxidant enzyme.

12. The composition of claim 11, wherein said antioxidant enzyme is catalase or superoxide dismutase.

13. The composition of claim 1, wherein said non-Aβ polypeptide is leptin.

14. The composition of claim 10, wherein said cytokine is an interferon or an interleukin.

15. The composition of claim 10, wherein said cytokine is a neurotrophic factor.

16. The composition of claim 1, wherein said Aβ polypeptide and said non-Aβ polypeptide are covalently linked.

17. The composition of claim 1, wherein said Aβ polypeptide comprises residues 1-40, 1-42, or 1-43 of SEQ ID NO:1.

18. A method of treating a patient diagnosed with Alzheimer's disease, said method comprising administering to said patient an amount of a composition effective to treat Alzheimer's disease, said composition comprising an Aβ polypeptide and an antibody having specific binding affinity for said Aβ polypeptide.

19. The method of claim 18, wherein said antibody comprises a Fab fragment.

20. The method of claim 18, wherein said antibody comprises a single chain Fv antibody fragment.

21. The method of claim 18, wherein said antibody comprises a $F(ab)_2$ fragment.

22. A method of treating a patient diagnosed with Alzheimer's disease, said method comprising administering to said patient an amount of an antibody effective to treat Alzheimer's disease, wherein said antibody is polyamine modified and has specific binding affinity for an Aβ polypeptide.

23. A method of diagnosing Alzheimer's disease in a patient, said method comprising a) administering a composition to said patient, wherein said composition comprises an Aβ polypeptide and an antibody having specific binding affinity for amyloid, wherein said antibody is labeled, and b) detecting the presence or absence of said antibody bound to amyloid in the brain of said patient, wherein said patient is diagnosed with Alzheimer's disease based on the presence of labeled amyloid in the brain of said patient.

24. The method of claim 23, wherein said detecting step comprises diagnostic imaging.

25. The method of claim 23, wherein said diagnostic imaging comprises positron emission tomography, gamma-scintigraphy, single photon emission computerized tomography, magnetic resonance imaging, functional magnetic resonance imaging, or magnetoencephalography.

26. The method of claim 23, wherein said diagnostic imaging comprises magnetic resonance imaging.

27. The method of claim 23, wherein said amyloid comprises β-amyloid plaques.

28. The method of claim 23, wherein said antibody is labeled with a contrast agent.

29. The method of claim 28, wherein said contrast agent is selected from the group consisting of gadolinium, dysprosium, and iron.

30. The method of claim 28, wherein said contrast agent is gadolinium.